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EXAMINER
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YAO, SAMCHUAN CUA

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* RAYMOND JOSEPH REISDORF and  
LOIC PIERRE ROLLAND

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Appeal 2007-4470  
Application 10/658,084  
Technology Center 1700

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Decided: March 21, 2008

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Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and  
CHUNG K. PAK, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the Examiner's refusal to allow claims 1 through 5, 8 through 16, and 18. Claims 6, 7, and 17, the only other claims remaining in the above-identified application, stand withdrawn from consideration by the Examiner as being drawn to a non-elected invention. We have jurisdiction pursuant to 35 U.S.C. § 6.

*STATEMENT OF THE CASE*

The subject matter on appeal is directed to “processes for producing tufted carpets that exhibit improved pile fiber retention under conditions of abrasive wear” (Spec. 1, ll. 6-8). Further details of the appealed subject matter are recited in representative claim 1 reproduced below:

1. A process for preparation of a tufted polyamide-type fiber carpet comprising

providing a primary backing tufted with yarn comprised of at least 85% by weight of fibers selected from the group consisting of nylon fibers, wool fibers, and blends thereof, said tufted primary backing having a carpet side and an opposite back side,

providing a molten polymer adhesive having a melt index of at least 150 according to ASTM D-1238 @190°C with a weight of 2.16 Kg on the back side of the tufted primary backing, said polymer adhesive comprising at least 85% by weight of one or more ethylene copolymers or terpolymers each comprised of 50 to 95 weight % of ethylene, and 5-50 weight % of at least one carboxylic acid comonomer,

compressing said tufted primary backing and said molten polymer adhesive layer under a moving belt that applies a pressure of at least 1 N/cm<sup>2</sup> for a period of at least 5 seconds during which time the polymer adhesive remains in a molten state, and

cooling said molten polymer adhesive to a temperature below the melting point of said molten adhesive.

The Examiner has relied upon the following references:

Kasamatsu	4,708,629	Nov. 24, 1987
Cross	4,731,143	Mar. 15, 1988

Scott	4,798,644	Jan. 17, 1989
Reith	4,939,036	Jul. 3, 1990
Fink	5,288,349	Feb. 22, 1994
Vinod	WO 95/14806 A1	Jun. 1, 1995

The Examiner has rejected the claims on appeal as follows:

1) Claims 1 through 5, 8 through 15, and 18 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Vinod, Scott, Reith, Fink, and Cross; and

2) Claim 16 under 35 U.S.C. § 103(a) as unpatentable over the combined disclosures of Vinod, Scott, Reith, Fink, Cross, and Kasamatsu.

The Appellants appeal from the Examiner's decision rejecting the claims on appeal under 35 U.S.C. § 103(a).

*FACTS, PRINCIPLES OF LAW, ISSUES, AND ANALYSIS*

Under 35 U.S.C. § 103(a), the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) secondary consideration (e.g., unexpected results). *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966). “[A]nalysis [of whether the subject matter of a claim would have been obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41 (2007) quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); see also *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick Co.*, 464 F.3d

1356, 1361 (Fed. Cir. 2006) (“The motivation need not be found in the references sought to be combined, but may be found in any number of sources, including common knowledge, the prior art as a whole, or the nature of the problem itself.”).

As evidence of obviousness of the subject matter defined by claims 1 through 5, 8 through 15, and 18 under 35 U.S.C. § 103(a), the Examiner has relied on the disclosures of Vinod, Scott, Reith, Fink, and Cross.<sup>1</sup> The Examiner finds, and the Appellants do not dispute, that:

[Vinod] discloses a process of making a carpet, the process comprises a) providing a primary backing tufted with nylon yarns; b) extruding a molten ethylene copolymer adhesive having 8-25 wt% of ester groups, 1-20 wt% of carboxylic acid groups, wherein the combined ester and carboxylic acid groups should not comprise more than 35 wt% of the ethylene copolymer (i.e. the copolymer comprises at least 65 wt% of ethylene) onto an underside surface of the primary backing; c) compressing the tufted primary backing and the molten adhesive at a pressure of at least of 2 psi for a time range of 1-10 seconds "to encapsulate the bases of the yarn tufts"; and, d) cooling the tufted primary backing and the ethylene adhesive to solidify the adhesive; wherein a melt index of the adhesive is less than about 500 dg/min (with a preferred range of less than about 200 dg/min) as measured by the procedure of ASTM D-1238 (abstract; page 2 line 31 to page 3 line 37; page 4 line 12 to page 6 line 29; page 7 full paragraph 1; page 9 line 8 page 10 line 24; claims 1-7). [Compare Ans. 4-5, with Br. 3-11 and Reply Br. 1-4.]

We find that the ethylene copolymer adhesive taught by Vinod provides good tuft binding strength in the finished carpet, due to, inter alia, the

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<sup>1</sup> We limit our discussion to claim 1 consistent with 37 C.F.R. § 41.37(c)(1) (vii) (2005).

carboxylic acid group in the adhesive having a high chemical affinity to the nylon and polyester tufts (pp. 5-6).

The Appellants contend that one of ordinary skill in the art would not have been led to select the “molten polymer adhesive having a melt index of at least 150 according to ASTM D-1238” recited in claim 1 from the molten polymer adhesive taught by Vinod, with a reasonable expectation of successfully providing good tuft binding strength in the finished carpet (Br. 5-7).

The initial question is, therefore, whether one of ordinary skill in the art would have been led to select the “molten polymer adhesive having a melt index of at least 150 according to ASTM D-1238” recited in claim 1 from Vinod’s molten polymer adhesive, with a reasonable expectation of successfully providing good tuft binding strength in the finished carpet. On this record, we answer this question in the affirmative.

As indicated *supra*, there is no dispute that Vinod teaches a molten ethylene copolymer adhesive having the claimed proportions of ethylene and carboxylic acid monomers and having a melt index of less than about 500 dg/min, preferably less than about 200 dg/min, as measured by the procedure of ASTM D-1238. Nor is there any dispute that the melt index of such molten ethylene copolymer overlaps with the broadly claimed melt index (*at least* 150) of the claimed ethylene copolymer adhesive. (Compare Ans. 5 with Br. 4). Therefore, we concur with the Examiner that one of ordinary skill in the art would have been led to employ Vinod’s molten ethylene copolymer adhesive having a melt index of, *inter alia*, at least 150 to 200, with a reasonable expectation of successfully providing good tuft binding

strength in the finished carpet. As stated in *In re Peterson*, 315 F.3d 1325, 1329 (Fed. Cir. 2003):

In cases involving overlapping ranges, we and our predecessor court have consistently held that even a slight overlap in range establishes a *prima facie* case of obviousness. *E.g.*, *In re Woodruff*, 919 F.2d at 1578, 16 USPQ2d at 1936-37 (concluding that a claimed invention was rendered obvious by a prior art reference whose disclosed range (“about 1-5%” carbon monoxide) abutted the claimed range (“more than 5% to about 25%” carbon monoxide)); *In re Malagari*, 499 F.2d at 1303, 182 USPQ at 553 (concluding that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (0.020-0.035% carbon) overlapped the claimed range (0.030-0.070% carbon); *see also In re Geisler*, 116 F.3d at 1469, 43 USPQ2d at 1365 (acknowledging that a claimed invention was rendered *prima facie* obvious by a prior art reference whose disclosed range (50-100 Angstroms) overlapped the claimed range (100-600 Angstroms)). We have also held that a *prima facie* case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985).

As a rebuttal to the *prima facie* case of obviousness established by the Examiner, the Appellants argue that Vinod teaches away from employing an ethylene copolymer adhesive having the broadly claimed melt index of *at least* 150 (Br. 4-5). The Appellants also argue that the Rule 132 Declaration executed by Raymond Reisdorf on November 9, 2004 (“Reisdorf Declaration”) shows that the closest prior art examples do not achieve a goal stated at page 10, lines 5-7, of the Specification (Br. 7). The Appellants emphasize that “[t]he Reisdorf Declaration was provided not so

much to demonstrate ‘unexpected results’, but instead to demonstrate that the examples of WO ‘806 [Vinod] do not achieve the goal stated in the present application...” (Reply Br. 2).

The question raised is, therefore, whether the arguments and evidence proffered by the Appellants are sufficient to rebut the prima facie case of obviousness established by the Examiner. On this record, we answer this question in the negative.

As argued by the Appellants (Br. 4-5), Vinod prefers a high melt viscosity adhesive because “more resin is available to penetrate and encapsulate the tufts in the primary backing” due to its lack of rapid flow (p. 7, ll. 15-20). However, contrary to the Appellants’ arguments at pages 4 and 5 of Brief, Vinod does not teach away from an adhesive having the claimed melt index. Rather, as indicated *supra*, Vinod specifically teaches its preference for a thermoplastic adhesive having a melt index of less than 200 dg/min., as measured by the procedure of ASTM D-1238, which melt index is inclusive of that claimed (p. 7, ll. 7-13). Indeed, we find that Vinod also teaches that:

It is believed that this resin provides for good tuft binding strength in the carpet, because it is capable of bonding to the nylon and polyester tufts by both a mechanical and chemical bonding means, unlike conventional hot melt adhesives.. Mechanical bonding is achieved by heat-activating the resin to a temperature above the melting point of the ethylene copolymer. The molten resin then penetrates the bases of the fiber tufts to encapsulate them and mechanically lock them into place. In addition, it is believed that the resin has a high chemical affinity to the nylon and polyester tufts due to the presence of the carboxylic acid groups in the ethylene copolymer. These carboxylic acid groups may bond to the



polyamide or polyester backbone by hydrogen bonding and may bond to the free amine ends in the polyamide backbone by covalent bonding to form amide linkages. As a result of this chemical action, good tuft binding strength is still obtained even if for some reason, only a small amount of adhesive is able to physically encapsulate the tufts.

In other word, even with a small amount of adhesive penetration due to a rapid flow caused by its high melt index, the adhesive taught by Vinod is still useful for providing good tuft binding strength. We find nothing in Vinod that would have discouraged one of ordinary skill in the art from employing Vinod's preferred adhesive having a melt index of less than 200 dg/m. We also find nothing in Scott, Reith, Fink, and Cross, which would have contradicted the express teaching of Vinod.

As to the Reisdorf Declaration, the Appellants do not argue that the showing therein demonstrates that the claimed subject matter imparts unexpected results (criticality), thereby rebutting the prima facie case established by the Examiner. *In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) ("Only if the 'results of optimizing a variable' are 'unexpectedly good' can a patent be obtained for the claimed critical range"); *In re Wertheim*, 541 F.2d 257, 267 (CCPA 1976)(recognizing that "ranges which overlap or lie inside ranges disclosed by the prior art may be patentable if the applicant can show criticality in the claimed range by evidence of unexpected results."); *see also In re Skoner*, 517 F.2d 947, 950 (CCPA 1975) ("Expected beneficial results are evidence of obviousness of a claimed invention. Just as unexpected beneficial results are evidence of unobviousness"). Nor do the Appellants dispute the Examiner's finding that the showing therein is not commensurate in scope with the protection sought

in the claims on appeal. *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971) (“[I]t is the view of this court that objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support”); *Ex parte Westphal*, 223 USPQ 630, 633 (BPAI 1983) (“The Examiner also comments that there were no tests on potatoes, included within claim 3. We note that potatoes were tested in Tables 7 and 10.”). Thus, we concur with the Examiner that the Appellants have not demonstrated criticality of the claimed subject matter.

To the extent that the Appellants may have taken the position that Vinod is not enabling as to the goal stated in the Appellants’ Specification, we are not persuaded that the Appellants have demonstrated non-enablement of Vinod’s disclosure. *In re Sasse*, 629 F.2d 675, 681 (CCPA 1980). The Appellants’ showing has not taken into account, *inter alia*, the state of the art, the guidance from the entire disclosure of Vinod, and the breadth of the claims on appeal. *In re Vaeck*, 947 F.2d 488, 495 (Fed. Cir. 1991). In this regard, we note that the Appellants have not shown that the claimed subject matter as a whole necessarily obtains the goal stated in the Appellants’ Specification. Nor have the Appellants shown that Vinod, together with what was known in the art, does not enable one of ordinary skill in the art to obtain the goal stated in the Appellants’ Specification without undue experimentation.

Thus, based on the totality of record, we determine that the preponderance of evidence weighs most heavily in favor of obviousness of the subject matter defined by claims 1 through 5, 8 through 15, and 18 within the meaning of 35 U.S.C. § 103(a).

As evidence of obviousness of the subject matter defined by claim 16, the Examiner has relied on the disclosure of Kasamatsu, in addition to the disclosures of Vinod, Scott, Reith, Fink, and Cross discussed above. The Appellants do not dispute the Examiner's finding at page 7 and 8 of the Answer that:

WO '806 [Vinod] discloses extruding a hot-melting adhesive to a secondary backing and bonding the adhesive coated secondary backing to a primary backing to form a carpet (page 3 full paragraph 2). WO '806 does not teach extruding a hot-melting adhesive onto an underside surface of a primary backing of a carpet at a distance of less than 5 cm. However, such would have been obvious in the art, because: a) it is old in the art to extrude a low viscosity hot-melting adhesive onto a continuously moving substrate such as a cloth, where an extrusion die is positioned such that it almost touches the moving substrate (col. 2 lines 35-56; col. 3 lines 17-37; figure 5); and, b) it is also well known in the art to extrude a hot-melting adhesive onto an underside surface of primary backing of a carpet. A preference on whether to extrude a hot-melting adhesive onto an underside surface of a primary backing or onto a bonding surface of a secondary backing is taken to be well within purview of choice in the art. [Compare Ans. 7-8, with Br. 10-11.]

The Appellants contend that Kasamatsu “fails to disclose (1) coating of carpet backings, (2) the use of the claimed adhesives, (3) any information as to suitable melt indices of the adhesives to be used therein, and (4) any information as to the distance between the die and the substrate to be coated” (Br. 10-11). As indicated *supra*, the Examiner has correctly found that Vinod teaches or would have suggested coating carpet backings with the claimed adhesive having the claimed melt index.

The dispositive question is, therefore, whether one of ordinary skill in the art would have been led to employ the adhesive of the type taught in Vinod in the manner taught by Kasamatsu. On this record, we answer this question in the affirmative.

As is apparent from pages 10 and 11 of the Brief, the Appellants have not disputed that “it is old in the art to extrude a low viscosity hot-melting adhesive onto a continuously moving substrate such as a cloth, where an extrusion die is positioned such that it almost touches the moving substrate ...” Moreover, as also illustrated in Figure 6 of Kasamatsu, the distance between the extrusion die and the cloth affects the thickness of the melt resin adhesive applied on the cloth.

Given the above teachings, we concur with the Examiner that one of ordinary skill in the art would have been led to extrude the molten polymer adhesive taught or suggested by Vinod onto the back side of the primary backing with the extrusion die taught by Kasamatsu placed at an optimum distance, such as less than 5 cm, with a reasonable expectation of successfully obtaining the desired thickness of the melted resin adhesive applied for a given utility.

Thus, based on the totality of the present record, we determine that the preponderance of evidence weighs most heavily in favor of obviousness of the subject matter defined by claim 16 within the meaning of 35 U.S.C. § 103(a).

#### *ORDER*

In view of the foregoing, the decision of the Examiner is affirmed.

Appeal 2007-4470  
Application 10/658,084

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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